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ABSTRACT

The purposes of this study were to investigate adolescent intellectual decline, and to attempt to determine some of the sexual differences possibly inherent in the phenomenon. It was hypothesized that (1) girls would decline in greater numbers and to a greater degree than boys; and (2) areas and amounts of sex differences of the decliners would differ from those of the total sample. Both of these hypotheses were substantiated under a design that examined the subject's student records to determine the type and the score of the IQ test each had taken in early adolescence. The subjects were then given another IQ test, the FIRO-B test of inter-personal relations, a semantic differential and a questionnaire on sex roles. The results showed that overall girls lost IQ points while boys gained. Decliners of both sexes lost an average of ten points, and also had fewer differences in their responses to the other measures than the boys and girls in the total sample. (Author/NE)

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The purpose of this study was to investigate the phenomena of adolescent intellectual decline; and to attempt to determine some of the sex differences possibly inherent in the phenomena. It was hypothesized that girls would decline in greater numbers and to a greater degree than boys. It was also hypothesized that areas and amounts of sex differences of decliners would differ from those of the total sample.

Both of these hypotheses were substantiated under a design that examined the student records, of the 471 adolescent subjects, to determine the type and the score of the IQ test the subjects had taken at the beginning of adolescence. The subjects were then given an IQ test, the FIRO-B test of inter-personal relations, a semantic differential and a questionnaire on sex roles.

The results showed that overall girls lost IQ points during adolescence while boys gained. Also in absolute numbers, more girls than boys lost IQ points. Both boy and girl decliners lost an average of about ten points during adolescence. Boy and girl decliners also had fewer differences in their responses to the other measures than did the boys and girls in the total sample.

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Adolescence is a very fluid time for most people. It is a span of time during which many changes take place, both physical and psychological. One of these areas of change is that of intellectual knowledge and interest as measured by group intelligence tests. It appears that during adolescence girls decrease in their I.Q. scores while boys increase (Terman, 1936; Macoby, 1966). This does not mean that there is no male intellectual decline, rather it means that the tendency is for boys to increase not decrease I.Q. scores.

While girl decliners have been examined and found to conform to the feminine stereotype to a greater extent than non-declining girls (MacFarlane and Sontag, 1954; Horney, 1967), little has been done to examine the boy decliner or to compare boy and girl decliners.

The purpose of this study was to more fully investigate the phenomena of adolescent intellectual decline; and to attempt to determine some of the sex differences possibly inherent in the phenomena. It was hypothesized that the girls would decline in greater numbers and to a greater degree than the boys. It was also hypothesized that the areas and amounts of sex differences of decliners would differ from those of the general adolescent sample.

Support for the first hypothesis was found in the work of Terman (1936) who found that between the ages of ten and sixteen, girls lost five times as many I.Q. points as boys did. Macoby (1966), Bradway and Thompson (1962), Conrad and Jones (1933) and Hopkins (1971) all tend to substantiate these findings. As Hernstein (1971) states, boys tend to maintain their I.Q. scores better than girls, no matter what the I.Q. score.

Support for the second hypothesis was not as clear cut as that of the first. Maccoby (1966) has suggested that the existence of personality differences, specifically independence/conformity and activity/passivity, in boys and girls are one of the reasons for male adolescent intellectual gain and female adolescent intellectual decline. If passivity and conformity are correlated with intellectual decline in girls, it would seem logical that declining boys would be more passive and dependent than boys in general and would be more similar to girls in these areas than would non-declining boys.

However, MacKinnon (reported in Maccoby, 1966) feels that the sex differences in intellectual functioning are due to repression. He feels that the boys'repression of their feminine characteristics and the girls' of their masculine characteristics is a cause of intellectual growth declining. Following this theory, boy and girl decliners should be more stereotypically "masculine" and "feminine" than all boys and girls and have greater differences between them.

A comparison of differences by sex was made in the areas of personality and perceptions of sex roles. The personality variables that were examined were: view of self as an active person, need to control people, need to be controlled, the need to include people, the need to be included by other people, the need to like people and the need to be liked by others. The perceptions of sex roles were examined through a questionnaire on sex roles.

The students participating in this study were 471 high school seniors (290 girls, 181 boys) from two public and two parochial schools in rural, urban and suburban areas of New York State. About 38% of the sample (179 students) came from schools run by the Sisters of the Presentation, a Roman Catholic order of sisters, while the rest of the subjects came from public

schools (292 students). The schools were selected because they represented the various population areas of the state and because they would allow access into student records.

All of the subjects who participated in the study were volunteers. (Only two students in all four schools refused to participate). The subjects' permanent school records were examined to determine their IQ score at the beginning of adolescence (around grade seven) and the type of IQ test that they had taken. The subjects were then given an IQ test of the same type that they had taken previously. Three of the schools took the Otis Quick Scoring Mental Abilities Test while one school took the Lorge-Thorndike Intelligence Test. All of the subjects also responded to the Fundamental Interpersonal Relations Orientation-Behavior (FIRO-B) test, a semantic differential on "myself," a list of twenty jobs to be categorized as being for men, women or both and a series of questions dealing with male-female roles.

In order to determine if a subject declined in IQ points during adolescence, his score at the beginning of adolescence was compared to his score at the end of adolescence. Subjects who experienced a decline or a gain in IQ scores greater than the standard error of measurement for the particular test were defined as decliners or gainers. The responses of the boy and girl decliners were compared as were the responses of all the boys and girls in the sample.

When the changes in IQ scores over adolescence of boys and girls were compared it was found that the boys increased in IQ points while the girls decreased. As Table 1 indicates boys and girls experienced significantly different changes in IQ scores during adolescence.

Table 1

THE MEANS*AND STANDARD DEVIATIONS FOR THE DIFFERENCE IN IQ SCORES BETWEEN BOYS AND GIRLS AT THE BEGINNING AND END OF ADOLESCENCE

	IQ Difference Mean	Standard Deviation of IQ Difference
Boys	1.62	11.6
Girls	-1.33	11.3

*The difference between the means is significant

$t = 2.134$, $p < .05$, $df = 470$

The number of boys and girls experiencing declines and gains in IQ scores was also examined. As Table 2 indicates the pattern of gains and losses was significantly different for boys than for girls. Boys tended to increase IQ points while girls tended to decrease IQ points.

Table 2

THE NUMBER* OF BOYS AND GIRLS EXPERIENCING CHANGES IN IQ SCORES GREATER THAN THE STANDARD ERROR OF MEASUREMENT OVER ADOLESCENCE

	Gained No. /%	Lost No. /%	Remained Constant No. /%
Boys	60/ 33.2	40/ 22.2	81/ 44.6
Girls	56/ 19.3	84/ 29.0	150/ 51.7

*The differences between groups are significant

$x^2 = 11.77$, $p < .05$, $df = 2$

Thus, this study appeared to agree with those that have gone before, that during adolescence there is a greater tendency for feminine intellectual decline than there is for masculine.

When the IQ scores of the decliners were compared to the IQ scores of all the students, it appeared that both boy and girl decliners lost about the same mean number of IQ points, although the girls' scores were higher than the boys throughout. Both boy and girl decliners start adolescence with scores about four points higher than their sex group and end adolescence with scores below their sex group.

Table 3

THE MEANS AND STANDARD DEVIATIONS FOR IQ SCORES OF BOYS AND GIRLS AT THE BEGINNING AND END OF ADOLESCENCE

		Beginning of Adolescence		End of Adolescence		Change in Score
	N	Mean	S.D.	Mean	S.D.	
All boys	181	106.80	15.64	108.42	14.58	+ 1.62*
Boy decliners	40	110.03	15.36	98.76	14.48	-11.27*
All Girls	290	110.84	10.85	109.51	13.49	- 1.33
Girl decliners	84	115.19	8.84	104.87	14.22	-10.32*

*$p < .05$

In addition to IQ, boys and girls were compared as to their responses to the six subscores of the FIRO-B test. Boy and girl decliners did not significantly differ on the need to be controlled but did differ on the other five subscores. This same pattern was repeated by all boys and girls. In both cases as Table 4 indicates, girls had higher needs to be included, to include

Table 4

MEANS AND STANDARD DEVIATIONS (S.D.) FOR THE SIX SUBSCORES OF THE FIRO-B TEST BETWEEN BOYS AND GIRLS WHO DECLINED IN ABILITIES AND BETWEEN ALL BOYS AND GIRLS
(Maximum Score Equals Nine)

	Decliners					All Students				
	Boys		Girls			Boys		Girls		
	Mean	S.D.	Mean	S.D.	t	Mean	S.D.	Mean	S.D.	t
Wanted Inclusion	1.93	2.86	4.60	3.36	3.71*	3.45	3.22	4.28	3.44	2.53*
Expressed Inclusion	3.46	2.38	4.93	2.03	3.07*	3.98	2.27	5.00	1.99	4.94*
Wanted Control	2.89	1.73	3.12	1.98	0.54	3.14	2.07	3.13	1.98	0.04
Expressed Control	2.28	2.10	1.19	1.88	2.50*	2.43	2.28	1.44	1.81	5.09*
Wanted Affection	3.04	2.76	5.07	5.53	3.51*	3.93	2.49	5.17	2.54	5.04*
Expressed Affection	2.64	2.00	4.14	2.52	2.81*	3.52	2.27	4.30	2.64	3.20*
	*(df=123, $p<.05$)					*(df=470, $p<.05$)				

others, to like others and to have others like them, than did boys. Boys had higher needs to control others than did girls. Boys who declined appeared to have somewhat lower needs to include others, like others or have others like them than did all boys.

The subjects were compared as to their scores on a semantic differential used to rate self as an active person. As Table 5 indicates there were no significant differences in how active boy and girl decliners rated themselves. However, in the total sample the girls rated themselves as being significantly more active than did the boys. This finding was in contradiction to the findings of Maccoby (1966) that girls were more passive than boys. A possible reason for the difference may be that this study did not examine the passivity/activity of adolescents but instead looked at their perceptions of their own passivity/activity.

Table 5

MEANS AND STANDARD DEVIATIONS (S.D.) FOR THE RATING OF SELF AS AN ACTIVE PERSON BETWEEN BOYS AND GIRLS WHO DECLINED IN ABILITIES AND BETWEEN ALL BOYS AND GIRLS

	M	S.D.	
Boys Decliners	5.01	.75	
Girls Decliners	5.14	.86	$t = .33$, $df = 123$
All Boys	5.17	.80	
All Girls	5.34	.83	$t = 2.12^*$, $df = 470$

*$p < .05$

The subjects were also asked questions pertaining to male-female roles. One of these questions asked if they had ever acted "dumb" in order to impress a member of the opposite sex. Although there were no significant differences in their patterns of reponses, for both the decliners and the total sample there was a greater tendency for boys to respond "never" than for the girls.

Table 6

A COMPARISON OF BOY AND GIRL DECLINERS AND ALL BOYS AND GIRLS TO THE QUESTION:

"Have you ever 'played dumb' or acted less smart than you are to impress a member of the opposite sex?"

	Frequently	Occasionally	Rarely	Never
Boy Decliners	0/0	4/14.3	6/21.4	8/64.3
Girl Decliners	0/0	12/16.9	27/38.0	32/46.1
	$x^2 = 3.21$			
All Boys	2/1.2	21/12.4	52/30.8	94/55.6
All Girls	7/2.4	55/19.2	78/27.2	147/31.2
	$x^2 = 4.62$			

*$p < .05$, df = 3

When the subjects were asked if they had ever acted smarter than they were to impress a member of the opposite sex the responses of the boy and girl decliners were quite similar. However, as Table 7 indicates, the boys and girls of the total sample had significantly different patterns of response. More boys of the total sample felt that they had acted smarter than they were to impress a member of the opposite sex, then did the girls.

Table 7

A COMPARISON OF THE RESPONSES OF BOY AND GIRL DECLINERS AND ALL BOYS AND GIRLS TO THE QUESTION:

"Have you ever acted smarter than you are to impress a member of the opposite sex?"

	Frequently	Occasionally	Seldom	Never
Boy Decliners	0/0	5/17.9	7/25.0	16/57.1
Girl Decliners	0/0	16/22.5	21/28.6	34/49.9
	$x^2 = 0.70$			
All Boys	3/1.8	56/33.1	51/30.2	59/34.9
All Girls	2/0.7	56/19.9	91/31.8	136/47.6
	$x^2 = 12.63^*$			

$^*p < .05$, df = 3

This same pattern of response was found when the subjects were asked which role or combination of roles - wife, mother or career woman - were most important for a woman. Again the boy and girl decliners were similar in their patterns of response, while in the total sample, the boys and girls were significantly different in their responses. It seems that boy decliners were more apt to see all three roles of wife, mother and career woman being most important for a woman (29.6 percent) than were all boys (22.9 percent); while girl decliners were less apt to see all three roles being most important for a woman (33.3 percent) than were all girls (39.6 percent). Also boys, be they decliner or not, were more apt to see the role of wife as the most important role for a woman, than were girls.

Table 8

A COMPARISON OF WOMEN'S ROLES SEEN AS IMPORTANT
BY BOY AND GIRL DECLINERS AND
ALL BOYS AND GIRLS

NUMBER / PERCENTAGE

	Decliners		Total Sample	
	Boy	Girl	All Boys	All Girls
Wife	6/22.2	5/7.2	33/21	23/8.3
Mother	1/3.7	6/8.7	6/3.8	25/9.0
Career Woman	4/14.8	9/13.0	21/13.4	23/8.3
Wife/Career Woman	0/0	4/5.8	7/4.5	24/8.3
Career Woman/Mother	0/0	1/1.4	3/1.9	4/14.0
Wife/Mother	8/28.6	21/30.4	51/32.5	69/24.8
All three	8/29.6	23/33.3	36/22.9	110/39.6
	$x^2 = 6.55$		$x^2 = 32.01$*	

*$p < .05$, df = 6

In a final question dealing with sex roles the subjects were asked to rate a series of twenty jobs as being jobs for men, for women or for both men and women. When the responses of the total sample were examined the boys and girls differed significantly in their ratings of thirteen of the twenty jobs.

In each case regardless of whether the job was one that had been traditionally considered male or considered female, the girls were more apt

than the boys to rate a job as being for both men and women.

The responses of the girl and boy decliners were also compared. In this comparison, it was found that the boy and girl decliners differed significantly in their ratings of seven of the twenty jobs.

Again in each of the twenty cases the girl decliners were more apt than the boy decliners to rate a job as being for both men and women. Throughout girl decliners were less apt to rate a job as being for both men and women than were all girls, while boy decliners were more apt to do so than were all boys.

Table 9

A COMPARISON OF THE RESPONSES OF BOY AND GIRL DECLINERS AND ALL BOY AND GIRLS TO THE RATING OF TWENTY JOBS

Job	Chi Square for Boy and Girl Decliners	Chi Square for All Boys and Girls
Author	2.20	0.98
Accountant	6.01*	16.26*
Elementary School Teacher	6.32*	21.23*
Secretary	2.44	11.65*
Nurse	4.12	23.49*
Lawyer	7.10*	26.73*
Truck Driver	0.37	5.44
Social Worker	1.55	2.46
Homemaker	5.10	5.37
High School Teacher	3.12	1.14
College Professor	13.41*	28.22*
Model	6.59*	31.03*
Engineer	3.27	16.85*
Doctor	2.99	26.42*
Executive	4.60	26.38*
Office Clerk	6.40*	11.55*
Carpenter	.97	10.51*
Superintendent of Schools	6.77*	20.98*
Dentist	2.55	3.68
Artist	2.24	1.78

*$p \leq .05$, df = 2

Overall, the results showed that IQ decline in adolescence affected girls and more than boys. Girls lost IQ points during adolescence while boys gained. Both boy and girl decliners started adolescence with IQ scores higher

than the mean and ended adolescence with scores lower than the mean. It was also discovered that in regard to the six subscores of FIRO-B, the decliners and the total sample had similar patterns of response. However, on the variables dealing with perceptions of sex roles and on the rating of self as an active person the boy and girl decliners were more similar in their responses than were the boys and girls of the general adolescent sample.

In the area of perceptions of sex roles, it appears that the reason for increased similarity in the responses of the decliners was that the girl decliners tended to express responses that were more typically stereotypic than did the total sample of girls. The boy decliners however tended to express responses that were less typically stereotypic than the total sample of boys. An example of this was in the rating of jobs, where girl decliners were less apt to rate a job for being for both men and women than were all girls, while boy decliners were more apt to rate a job for being for both men and women than were all boys.

Girl decliners appear to be accepting of the feminine stereotype including that it isn't feminine to be smart. Boy decliners however, seem less accepting of the masculine stereotype.

Why this happens and how is our next important step.

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